

Research Results

El Paso Independent School District, El Paso, TX, 2001

Abstract

In Fall 2001, Cognitive Tutor Algebra I was used in seven schools for students who had previously failed Algebra I. An additional two schools used a traditional curriculum for similar students. Six of the seven schools using Cognitive Tutor had used a traditional curriculum the previous year for similar students. These data allow us to compare year-over-year improvements in schools that switched to the Cognitive Tutor as well as same-year differences between schools who used Cognitive Tutor and those who didn't. The results show that students using the Cognitive Tutor passed the Texas state End of Course exam at a higher rate than similar students who didn't use the Cognitive Tutor from the previous year. Additionally, pass rates in 2001 were higher among Cognitive Tutor students than among students who used a traditional curriculum.

Study Design:

Comparison Group

Measures:

Standardized exam: Texas
End of Course exam for
Algebra I

Study location:

El Paso Independent School
District, El Paso, TX

Study conducted by:

El Paso Independent School
District

Course assessed:

Cognitive Tutor Algebra I

Data collection date:

2001

District Information:

Type: Public, urban
Students Enrolled: 65,000
% of students identified as
economically
disadvantaged: 63%
% of students with limited
English: 28%

Ethnic Breakdown:

Caucasian: 7%
Hispanic: 90%

Participants

Participants were students in El Paso Independent School District who had previously failed Algebra I. Cognitive Tutor Algebra I was used at seven schools in the district. A traditional curriculum was used in two schools. All but one of the schools had used a traditional curriculum in the 2000 school year. 90% of the students in this population were Hispanic; 28% had limited English proficiency, and 65% were identified as "at risk."

Method

In December of 2001, students were administered the Texas state End of Course exam, following one semester with the target curriculum (Cognitive Tutor Algebra I in seven schools; a traditional curriculum in two others).

Results

As shown in Table 1, the five schools who switched from a traditional curriculum to the Cognitive Tutor had higher pass rates on the Texas End of Course exam. The improvement from 2000 to 2001 was approximately double that seen in the schools who stayed with a traditional curriculum (20% vs. 10%).

| | 2000 | 2001 |
|--|---------|----------|
| Schools adopting CT in 2001 | 16 (63) | 36 (117) |
| Schools using traditional curriculum both years | 6 (303) | 16 (389) |

Table 1: Pass rates on Texas Algebra EOC exam. The number of students is in parentheses. This table excludes the one school that used Cognitive Tutor in both 2000 and 2001. That school had pass rates of 39% in 2000 and 38% in 2001. In addition, the table excludes one school that did not participate in the program in 2000. In 2001, that school had a 10% pass rate.

A closer analysis of the Texas Algebra EOC results shows that the advantage for the Cognitive Tutor classes applies across all objectives addressed in the curriculum, although the advantage is most pronounced for graphing. Table 2 presents these results.

| Curriculum | Cognitive Tutor | Traditional |
|--|-----------------|-------------|
| Characteristics of graphing | 76 | 54 |
| Applications of graphing | 56 | 21 |
| Linear functions | 49 | 27 |
| Linear equations/inequalities | 28 | 26 |
| Quadratic equations | 56 | 33 |
| Polynomials | 51 | 29 |
| Exponents, quadratic situations, right triangles | 17 | 14 |
| One- or two-variable situations | 28 | 23 |
| Probability, ratio, proportion, data analysis | 71 | 47 |

Table 2: Pass rates (percentage) on Texas Algebra EOC exam, by objective. These data include all seven Cognitive Tutor schools and both traditional schools who took the Texas EOC exam in 2001.

Discussion

Cognitive Tutor Algebra I is clearly increasing pass rates in the El Paso ISD. Although the schools that continued with a traditional curriculum also increased their pass rates from one year to the next, the increase was much greater for the schools that adopted the Cognitive Tutor curriculum. When we look at performance in the 2001 school year, we find that students who were able to take a Cognitive Tutor class were more likely to pass the test, and that this increase involves improvement on most objectives, especially graphing.

For more information or for additional copies of this report, please go to <http://www.carnegielearning.com/results/reports> or send email to researchpartner@carnegielearning.com

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